Data Mining For More Efficient Parking And Transit

James O. Kimrey, III - Sr. IT Professional
Texas A&M Transportation Services
This talk will focus on
• Parking and Transit data streams
• Challenges associated with interpreting those data
• Successes we have achieved
To meet our goal of making Parking and Transit at Texas A&M a pleasurable experience
Parking
Parking

Garages

- Parking spaces
  - Reserved
  - Available
  - Total
- Entry
  - Date & Time
  - Location (lane)
- Exit
  - Date & Time
  - Location (lane)
- Duration of stay

- Payment
  - Method
  - Card type (NO NUMBERS!)
  - Location (pay station)
  - Date & Time
  - Processing time
- Time between payment and exit
- Account (if hangtag was used)
Parking

Citations

- Vehicle
  - Year, Make, Model
  - License Plate
- Date & Time
- Location
  - Lot
  - GPS
- Violation
- Issuing Officer
- Picture
- You (from vehicle info)

- Appeal
- Payment
  - Method
  - Card type (NO NUMBERS!)
  - Location
  - Date & Time
Data Mining

- Garages & Surface Lots
  - Occupancy (Hourly → Yearly → Lifetime)
  - Identify trends
  - Adjust parking rates
  - Estimate maintenance costs
  - Estimate maintenance frequency

- Citations
  - Identify trends
  - Identify problem
    - Locations
    - Lots
    - Vehicles
  - Adjust fines
Parking

Challenge: Student Government said there should be no citations during move-in because freshmen were getting a disproportionate number of citations. Mine data for citations for month of August, by class year.
Parking

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Success: Determined freshmen actually had lowest citation rate and seniors had highest!
Bus
- Speed
- Location
- Direction
- Route
- Capacity
- Passenger count
- ETA to next stop
- Route Schedule Adherence (RSA)
- and more

Route
- Name
- Pattern
- Stops
- Trips
- Icon
- ID
- and more
Transit

Stop
- Name
- Boarding
- Alighting
- ETA for next bus
- Location
- Type (Timed/Waypoint)
- ID

Pattern
- Location array
- Effective dates
Bus Routes Website

- Page Views (hits)
- Real-time
  - Active users (per second/minute)
  - Top active pages
  - Top referrals
- Acquisition
- and more Google Analytics
Transit Challenges & Successes
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Challenge:
How do we know the bus routes website is meeting user needs?
Success:
Data mining page views across the first week of class shows dramatic increase in usage.
Challenge: How many buses do we need to put on a route?
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Success: Data mine ridership on each route to determine most in demand routes, and allocate more buses.
Challenge: How do we know our bus stops are in a good location?
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Success: Data mine boarding and alighting counts for each bus stop to determine effectiveness of each bus stop, and adjust bus stops.
Challenge: How do we know off campus students have easy access to a bus route?
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Success: Data mine student addresses, then geolocate, heat map, and overlay with bus routes, to determine effectiveness of bus routes coverage.
Just The Tip Of The Iceberg
Special Events

Alternative Transportation

Leased Vehicles

Charters

Web API

RSS

Just The Tip Of The Iceberg